

MNR goes green with city's first windmill farm

Five vertical axis wind turbine installation was financed through a \$92,500 grant from Ontario's Ideas and Innovation Fund

Posted By Reg Clayton

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MNR project lead Terry Ruuska at MNR's Kenora fire management headquarters anticipates the five wind turbines will generate up to one quarter of the facility's annual electricity requirements. Reg Clayton of the Enterprise

Pending a final inspection and certification by company engineers, the city's first windmill farm is ready to start generating electricity this week at the Ministry of Natural Resources Fire Management Headquarters at Kenora Airport.

The five vertical axis wind turbine installation was financed through a \$92,500 grant from Ontario's Ideas and Innovation Fund.

The turbines were originally installed and up and running last December, explained Terry Ruuska, MNR's project lead at the fire management headquarters.

However, initial problems with the turbine drive shafts, a metallurgical defect in the manufacturing process, led to excessive vibration resulting in a loss of alignment which caused the turbines to fail.

Ruuska noted the company, Cleanfield Energy, has since replaced the defective components.

"They've been a good partner and updated our entire turbine facility," he said.

Each turbine is rated at 3.5 kw and if all five perform as expected, Ruuska anticipates the system will generate 20 to 25 percent of the 115,500 kw/h of MNR's annual electricity requirements to power everything from air conditioners to computers at the fire management headquarters.

The vertical axis turbines differ from conventional windmills as they feature three airfoils that rotate vertically around a driveshaft thereby utilizing relatively low wind velocities from any direction to generate electricity. The turbines are also comparatively smaller than the larger flat bladed windmills which rotate horizontally and must be turned in the direction of the prevailing winds and therefore can't take advantage of cross winds to generate optimum power.

Ruuska explained the minimum effective wind speed is 4 to 4.5 m/sec for MNR's system requirements. A wind sensor, an anemometer, detects when sufficient winds are available and powers up the system until the turbines are rotating on their own. The approximate 13 metre high towers and turbines are within Transport Canada's height restrictions for towers at airports.

"We needed something that could work at our airport," Ruuska said.

Routine maintenance on the turbines and related systems will be performed by master electrician Carleton Dent of Concept Energy in Kenora.

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"In a system like this there are no batteries, Ontario Hydro stores the power for you on the provincial grid," Dent said.

He explained how electricity generated by the turbines is converted from AC to DC power, "cleaned up" and converted back to AC where it passes through a transformer and on to the provincial grid.

According to the Net Metering agreement with Hydro, MNR is essentially credited for the energy it supplies to the grid and billed for the electricity it draws. MNR has also installed its own reference meter on the system in order to estimate how much electricity its wind farm produces.

Dent suggests the size and arrangement of the vertical axis turbines makes the system ideal for residential installations as homeowners make a personal investment in going green to reduce energy costs.

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